

1745



PATENT
Attorney Docket No. 127486602

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION OF:

BILL GRAY and
HORST THUMM

SERIAL NO. 09/747,571

FILED: DECEMBER 22, 2000

FOR: METHOD AND APPARATUS
FOR EMBOSSING EXPANDED
GRAPHITE SHEET MATERIAL
UNDER REDUCED PRESSURE

GROUP ART UNIT: 1745

EXAMINER: Not yet assigned

CERTIFICATE OF MAILING

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April 10, 2001

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INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants submit herewith a copy of each of the
following references for consideration in connection with
the above application.

<u>U.S. Patent No.</u>	<u>Inventor(s)</u>	<u>Issue Date</u>
4,534,922	Atkinson et al.	08/85
4,752,518	Lohrke et al.	06/88
4,988,583	Watkins et al.	01/91
5,039,371	Cremens et al.	08/91
5,300,370	Washington et al.	04/94
5,313,325	Lauf et al.	05/94
5,521,018	Wilkinson et al.	05/96
5,527,363	Wilkinson et al.	06/96
5,885,728	Mercuri et al.	03/99
6,037,074	Mercuri et al.	03/00

<u>Foreign Patent No.</u>	<u>Country</u>	<u>Date</u>
60-012672	Japan	01/85
60-65781	Japan	04/85
61-007570	Japan	01/86
61-007571	Japan	01/86
09-117964	Japan	05/97
10-125337	Japan	05/98

The above references are listed on the enclosed Form PTO-1449 entitled "Information Disclosure Citation."

Concise Explanation of the
Relevance of the Cited References

Atkinson et al. U.S. Patent No. 4,534,922 discloses graphite gaskets with an improved release characteristic that are pressed and then embossed with a pattern of relatively raised areas surrounded by interconnected depressions.

Lohrke et al. U.S. Patent No. 4,752,518 discloses a graphite material comprising a mass of expanded graphite

particles compressed together so as to form a graphite foil. The graphite foil is provided with a plurality of apertures disposed on at least one surface so as to substantially prevent formation of bubble-like deformations.

Watkins et al. U.S. Patent No. 4,988,583 discloses a fluid flow field plate for use in a solid polymer electrolyte fuel cell. The plate has a single continuous open-faced channel formed in a major surface of the plate. The channel traverses a major central area of the surface in a plurality of passes.

Cremens et al. U.S. Patent No. 5,039,371 discloses an apparatus for consolidating sheets of continuous graphite fiber in a thermoplastic matrix resin using a roller in conjunction with a heating surface and a vacuum bag. The apparatus consolidates a plurality of pre-impregnated sheets of a thermoplastic composite into a single, solid, panel without the use of autoclaves or heated platens.

Washington et al. U.S. Patent No. 5,300,370 discloses a laminated fluid flow field assembly for electrochemical fuel cells consisting of a separator and stencil layer. The separator layer is formed of electrically conductive,

substantially fluid impermeable sheet material and the stencil layer is formed of electrically conductive sheet. Both layers have two oppositely facing major surfaces. The stencil layer has a fluid inlet and at least one opening between the major surfaces. The layers are consolidated along one of their major surfaces, thereby forming at least one open-faced channel for conducting pressurized fluid introduced at the fluid inlet.

Lauf et al. U.S. Patent No. 5,313,325 discloses a light- emitting particle comprising a composite of carbon-bonded fibers prepared by blending said fibers with a powder, dispersing said mixture, and curing the article to complete the process.

Wilkinson et al. U.S. Patent No. 5,521,018 discloses an embossed fluid flow field plate for electrochemical fuel cells. The plates comprise two sheets of compressible, electrically conductive material and a metal sheet interposed between the compressible sheets.

Wilkinson et al. U.S. Patent No. 5,527,363 discloses a method of fabricating and embossing compressible,

electrically conductive sheets for use as fluid flow field or separator plates for electrochemical cells.

Mercuri et al. U.S. Patent No. 5,885,728 discloses a flexible graphite sheet having embedded ceramic fibers extending from its surfaces into the sheet to increase the permeability of the sheet to resin and to create a shape useful as a flow field plate in fuel cells.

Mercuri et al. U.S Patent No. 6,037,074 discloses a flexible graphite sheet having embedded ceramic fibers extending from its surfaces into the sheet to increase the permeability of the sheet to resin and create a shape useful as a flow field plate in fuel cells. The flexible graphite sheet includes a thin sheet of flexible graphite affixed to the grooved sheet to provide support.

Japanese Patent Publication No. 60-012672 discloses a separating plate for a fuel cell having no dimensional change during operation, high conductivity and chemical resistance, which is formed by impregnating liquid resin binder in expansion graphite moldings, drying, and curing the material. The applicants have not obtained a full-text English language translation of the Japanese language publication, but are

willing to obtain and provide such a translation upon request.

Japanese Patent Publication No. 60-65781 discloses a method of making an impermeable swollen graphite molded body to be used as fuel cell partition plates.

Japanese Patent Publication No. 61-007570 discloses a method of making a separator plate for a fuel cell by laminating and pressure molding multiple swollen graphite sheets.

Japanese Patent Publication No. 61-007571 discloses a method of manufacturing a separator with grooves for fuel cells whose expansion graphite filling ability is high by stacking expansion graphite sheets and press-molding them. The applicants have not obtained a full-text English language translation of the Japanese language publication, but are willing to obtain and provide such a translation upon request.

Japanese Patent Publication No. 09-117964 discloses a method and apparatus for molding composite materials by

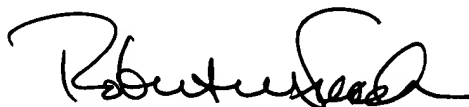
removing low molecular weights of materials at a specific point in the process.

Japanese Patent Publication No. 10-125337 discloses a method of making a separator having gas-liquid impermeability and high electrical conductivity by forming the separator into a final molded product having specific bulk densities. The applicants have not obtained a full-text English language translation of the Japanese language publication, but are willing to obtain and provide such a translation upon request.

This Information Disclosure Statement is being submitted before the receipt of a first Office Action on the merits of the application.

Please charge any fees incurred in connection with this submission to Deposit Account No. 13-0017 in the name of McAndrews, Held & Malloy, Ltd.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Robert W. Fieseler", is written over a horizontal line.

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